

# Hair analysis for $\Delta^9$ -tetrahydrocannabinolic acid A (THCA-A) and $\Delta^9$ -tetrahydrocannabinol (THC) after handling cannabis plant material.

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## Abstract

A previous study has shown that  $\Delta^9$ -tetrahydrocannabinolic acid A (THCA-A), the non-psychoactive precursor of  $\Delta^9$ -tetrahydrocannabinol (THC) in the cannabis plant does not get incorporated in relevant amounts into the hair through the bloodstream after repeated oral intake. However, THCA-A can be measured in forensic hair samples in concentrations often exceeding the detected THC concentrations. To investigate whether the handling of cannabis plant material prior to consumption is a contributing factor for THC-positive hair results and also the source for THCA-A findings in hair, a study comprising ten participants was conducted. In this study, the participants rolled a marijuana joint on five consecutive days and hair samples of each participant were obtained. Urine samples were taken to exclude cannabis consumption prior to and during the study. THCA-A and THC could be detected in the hair samples from all participants taken at the end of the exposure period (concentration range: 15-1800 pg/mg for THCA-A and < 10-93 pg/mg for THC). Four weeks after the first exposure, THCA-A could still be detected in the hair samples of nine participants (concentration range: 4-57 pg/mg). Furthermore, THC could be detected in the hair samples of five participants (concentration range: < 10-17 pg/mg). Based on these results, it can be concluded that at least parts of the THC as well as the major part of THCA-A found in routine hair analysis derives from external contamination caused by direct transfer through contaminated fingers. This finding is of particular interest in interpreting THC-positive hair results of children or partners of cannabis users, where such a transfer can occur due to close body contact. Analytical findings may be wrongly interpreted as a proof of consumption or at least passive exposure to cannabis smoke. Such misinterpretation could lead to severe consequences for the people concerned. Copyright © 2015 John Wiley & Sons, Ltd.

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